Abstract

The present invention relates to methods for operating and controlling the temperature of inert electrodes during production of molten aluminium by electrolysis of an aluminous ore, preferably alumina, dissolved in molten salts, preferably a fluoride based electrolyte, in an electrolysis cell with vertical or essentially vertical electrode configuration.

The invention describes methods of designing and operating inert electrodes in a vertical and/or inclined position for production of aluminium metal, where said electrodes have an operating temperature that may deviate from the electrolyte temperature, thereby controlling the dissolution of electrode materials and preventing solid deposit formation on the electrodes. The present invention is also applicable to aluminium production cells utilising inert electrodes in a horisontal configuration, and traditional Hall-Hèroult cells retrofitted with inert anodes.